

May 25, 1960

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Dear John--

Forgive me for giving only a rather hasty answer about Salser's paper. You are right that it does parallel some of my own writing, and having sinned myself, I would hardly enjoin anyone else against it. The non-distinguishability of parasites from plasmagones underlies the introduction of the term "plasmid" (to include both)-- *Physiol. Revs.*, 32:403, 1952. I would say now that we might distinguish a virus not by its pathogenicity, but by whether it had a particular adaptation to survive outside the cell and to reenter susceptible cells,-- not a very fundamental criterion. In another paper -- #54 of encl., -- we struggled with the problem of defining 'creative information', we called this 'biologically significant information', rather clumsily. The problem is still with us; I don't think that Salser has been able to clarify it very much further, however. Genetic vs. 'non-genetic' (or epigenetic) rather provoked me, as used by Ephrussi and Nannay; in #47 I suggested that we should simply distinguish 'nucleic' from non-nucleic and even epinucleic information. The main point I would stress now is that a long heteropolymer like DNA is informationally dense (2 bits per nucleotide) compared to the content of most of the other systems, generally 1 bit per particle or per system.

On the whole the paper is quite reasonable, except for the reliance on coacervates pp.18 ff and membranes as primary reservoirs of replicating information -- that is, my own sequence would put polymers first. The viewpoint is somewhat, not startlingly, different from other contributions in the field; it is well written; it is not especially new, but not much in this field is. If he were my student, I would give him an A in the course, but would not encourage him to launch his career in scientific publication with this type of article.

I do object to the ~~xxxxxxxxxx~~ title.

Have you caught any cosmic dust? Any ideas how to? Are there any molecules in the primary cosmic radiation? If so they might give spectacular and identifiable events (possibly not now being looked for) in emulsion exposures. (Presumably any such molecules would have been torn apart long since, but what are the quantitative inferences?)

Sincerely,

Joshua Lederberg

P.S. - Bravo on the molecular models! I have been thinking the same way, but hardly in such the right party privacy, rather than by publication. Can you spare me a half dozen points for propaganda?